

WHAT IS CLAIMED IS:

1. An efficient multiplexing method, comprising:  
receiving a message at a first of a plurality of ports, the message associated  
with a destination;  
5 if the destination is the first of the plurality of ports, sending the message to  
the destination;  
else if the destination is a designated distributor, associating with the message  
a destination identifier of the first of the plurality of ports and sending the message to  
the designated distributor through a switching fabric; and  
10 else if the destination is not the designated distributor, sending the message to  
the destination through the switching fabric.
2. The method of claim 1, wherein the plurality of ports is the sum of one  
and n and the switching fabric utilizes n-to-one multiplexing logic, wherein n is a  
15 multiple of two.
3. The method of claim 1, wherein the switching fabric comprises a non-  
blocking crossbar architecture.
- 20 4. The method of claim 1, further comprising if the destination is the  
designated distributor, retrieving forwarding data associated with the message, the  
forwarding data associated with the destination, sending the message and at least a  
portion of the forwarding data to the designated distributor through the switching  
fabric, and sending the message from the designated distributor through the fabric to a  
25 plurality of destinations in the network using the forwarding data.
5. The method of claim 4, wherein the associated data comprises a bit  
mask.
- 30 6. The method of claim 4, wherein sending the message comprises one of  
the group consisting of broadcasting the message to all of the plurality of nodes and  
broadcasting the message to a designated portion of the plurality of nodes.

7. An efficient multiplexing system, comprising:

a switching fabric operable to send a message to a designated distributor if a destination identifier matches a receiving port of a plurality of ports;

a designated distributor coupled to the switching fabric; and

5 a plurality of ports coupled to the switching fabric, each of the plurality of ports operable to:

receive the message at the receiving port of the plurality of ports, the message associated with a destination;

10 if the destination is the receiving port of the plurality of ports, send the message to the destination;

else if the destination is the designated distributor, associate with the message the destination identifier of the receiving port of the plurality of ports and send the message to the designated distributor through the switching fabric; and

15 else if the destination is not the designated distributor, send the message to the destination through the switching fabric.

20 8. The system of claim 7, wherein the plurality of ports is the sum of one and  $n$  and the switching fabric utilizes  $n$ -to-one multiplexing logic, wherein  $n$  is a multiple of two.

9. The system of claim 7, wherein the switching fabric comprises a non-blocking crossbar architecture.

25 10. The system of claim 7, wherein the plurality of ports are each further operable to, if the destination is the designated distributor, retrieve forwarding data associated with the message, the forwarding data associated with the destination and to send the message and at least a portion of the forwarding data to the designated distributor through the switching fabric, and the designated distributor is further  
30 operable to send the message through the fabric to a plurality of destinations in the network using the forwarding data.

11. The system of claim 10, wherein the associated data comprises a bit mask.

5 12. The system of claim 10, wherein the designated distributor is operable to send the message by a broadcast of the message to all of the plurality of nodes or a broadcast of the message to a designated portion of the plurality of nodes.

13. Data multiplexing logic, comprising:

a switching fabric operable to send a message to a designated distributor logic node if a destination identifier matches a receiving node of a plurality of output nodes;

logic coupled to the switching fabric, the logic comprising the plurality of output nodes and the designated distributor node, the logic operable to:

receive the message at the receiving node of the plurality of output nodes, the message associated with a destination;

if the destination is the receiving node of the plurality of output nodes, send the message to the destination;

else if the destination for the message is the designated distributor logic node, associate with the message the destination identifier of the receiving node of the plurality of output nodes and send the message to the designated distributor logic node through the switching fabric; and

else if the destination for the message is not the designated distributor logic node, send the message to another of the plurality of output nodes through the switching fabric.

14. The logic of claim 13, wherein the plurality of ports is the sum of one and  $n$  and the switching fabric utilizes  $n$ -to-one multiplexing logic, wherein  $n$  is a multiple of two.

15. The logic of claim 13, wherein the switching fabric comprises a non-blocking crossbar architecture.

16. The logic of claim 13, wherein the logic comprising the plurality of output nodes is further operable to, if the destination is the designated distributor logic node, retrieve from a memory forwarding data associated with the received message, the forwarding data associated with the destination, send the message and at least a portion of the forwarding data to the designated distributor through the switching fabric, and the designated distributor logic node is further operable to send the message through the switching fabric to at least a portion of the plurality of output nodes using the forwarding data.

17. The logic of claim 16, wherein the designated distributor logic node, the switching fabric, and the plurality of output nodes utilize at least one field programmable gate array.

5 18. The logic of claim 16, wherein the associated data comprises a bit mask.

10 19. The logic of claim 16, wherein the designated distributor is operable to send the message by broadcasting of the message to all of the plurality of nodes or broadcasting the message to a designated portion of the plurality of nodes.

15 20. The logic of claim 16, wherein the memory comprises a content-addressable memory.